THE DEFLECTION TO THE RIGHT.

The difference between the deflection to the right in the Northern Hemisphere and that to the left in the Southern Hemisphere results from the nature of the forces that produce these deflections, and not from the way in which the observer looks at the weather map. The deflections are true natural phenomena, not mere optical delusions.

When a body rests quietly on the earth's surface the centrifugal force, *cd*, due to the diurnal rotation of the earth, gives the body a slight tendency to move toward the equator, which tendency is counterbalanced by the fact that the surface of the earth, and especially of the ocean, is an oblate spheroid; the attraction of gravity, *ac*, is not perpendicular to this spheroidal surface, but is directed toward the center of the earth

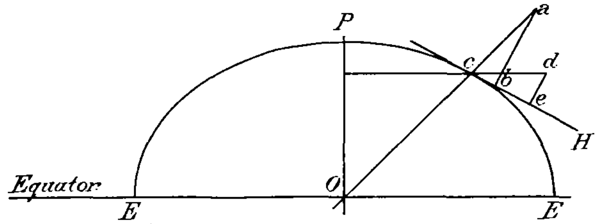

FIG. 1.—Deflection to the right.

and its action on any body at the surface must be resolved into two components; the principal one, *ab*, is vertical or normal to the spheroidal surface and constitutes the greater part of what we call weight, the other component, *bc*, is a feeble horizontal sliding force directed toward the pole (the North Pole in the Northern Hemisphere and the South Pole in the Southern). The centrifugal force, *cd*, is directed outward in the plane of the small circle of latitude and is also to be resolved into two parts, one of which, *ed*, is normal to the surface of the spheroidal globe; it acts upward, and therefore partly counteracts the force of attraction; the difference between it and the attraction is called *apparent gravity*, and gives rise to what is ordinarily known as the weight of a body. The other component of the centrifugal force, namely, *ce*, is parallel to the surface of the globe and is a horizontal sliding force directed toward the equator. But as the earth's surface represents a state of equilibrium, therefore the two horizontal components, respectively pushing northward and southward, just counterbalance each other, or *bc* is equal and opposite to *ce*. If the earth should rotate faster or slower, then the curvature of the spheroid would change so as to always maintain this balance between *bc* and *ce* so that bodies would have no tendency to slide either north or south.

Now a body or a mass of water or air that is in motion east or west relative to the earth's surface is rotating around the earth's axis respectively faster or slower than the earth itself. If it has a greater velocity than the earth, it must therefore have a greater tendency to slide toward the equator; if it moves westward, as does an easterly wind, then it presses from the equator. These laws are true for both hemispheres; in both cases a west wind moving eastward presses toward the equator, which is toward the right-hand for west winds in the Northern Hemisphere but toward the left-hand for the Southern Hemisphere. Other pressures may also affect the motions of the wind so that these deviations to the right or to the left may not become apparent, but the tendencies or pressures always exist and are greater in proportion to the relative velocity of the wind relative to the earth's surface, and they contribute appreciably to the low pressure in a hurricane center and the high pressure in a high area.

When we consider a cannon ball, a railroad train, a pendulum, or a gyroscope this deflection due to the rotation of the earth is at once apparent. When a pendulum is allowed to swing freely its plane of oscillation changes continuously relative to the supports of the pendulum at a certain definite rate depending on the latitude, the rate is most rapid at the pole and is zero at the equator. It is the same way with the plane of rotation of the gyroscope on its axis. "Ordinarily neither the pendulum nor the gyroscope comes back to the plane of rotation in 12 to 24 hours. The pendulum will do so at the poles, but the gyroscope can preserve an invariable plane only in the absence of friction and when its axis is parallel to that of the earth, or whenever it is mounted in gimbals in such a fashion as to realize literally a ideal frictionless *point suspension at the center of gravity*." Every moving body has a tendency to retain its *direction* of motion and its momentum or inertia, and it is the effort to do this or the combination of this effort with the effort of the rotating earth to change that direction or momentum that causes the pendulum to move in a new resultant direction. These changes of the planes of the pendulum and the gyroscope are real, they can easily be observed, and they agree entirely with the calculation of the resultant of the action of two forces, namely, the initial motion of the moving mass and the disturbance of this motion by the enforced diurnal motion around the earth's axis.—*C. A.*

CORRIGENDA.

Hawaii.—Continued unsettled conditions, with heavy windward rains, but month rather dry in many leeward localities; days warm, but nights appreciably cooler. Young cane grew well, but excessive moisture and shortage of labor rendered difficult the keeping down of weeds in windward plantations. 1906 cane maturing; tasselling general by close of month. Cane growth in Kau, Hawaii, retarded during major portion of month by dry and windy weather. Pineapple growers busy all month expanding plantations; a fine winter crop maturing rapidly, and a small quantity of scattering fruit already ripe. Picking coffee all month. Rice ripening, and harvesting in full progress by close of month. Windward pastures in good condition, but leeward pastures short and dry, especially in lower levels.—*Alex. McC. Ashley.*

THE WEATHER OF THE MONTH.

By Mr. WM. B. STOCKMAN, Chief, Division of Meteorological Records.

PRESSURE.

The distribution of mean atmospheric pressure is graphically shown on Chart VIII and the average values and departures from normal are shown in Tables I and V.

The isobars of mean pressure for the month, as a rule, followed the contour of those of the normal for October, but everywhere they were above the normal, except in the extreme southeastern part of Arizona and in the Sacramento Valley and southwestern portions of California.

Departures ranging between +.05 and +.10 inch occurred in New England, the Middle Atlantic and northern part of the South Atlantic States, and generally in a northwesterly direction from the latter two districts to the Pacific Ocean, with a crest showing departures ranging from +.10 to +.14 inch overlying western South Dakota, southwestern North Dakota, Montana, except the northeastern portion, Wyoming, Idaho, except the extreme southern portion, and northern Washington. The minus departures were very slight.

The mean pressure for the month of October, 1905, everywhere showed an increase over the preceding month. To the westward of the ninety-fifth degree of longitude, excepting along the California coast, the changes were greater than +.10 inch; over the northern and middle slope and Plateau regions, more than +.15 inch; over Montana, except the northeastern portion, northern Wyoming, Idaho, and eastern Washington, more than .20 inch, with the crest over northwestern Montana, where they were +.26 inch.